CLAIMS:

1. An artificial lipid bilayer membrane lipid substitution method, comprising the step of attaching a tubule for lipid substitution to a bulk phase of an artificial lipid bilayer membrane so as to add, via the tubule, a second lipid solution whose lipid composition is different from a lipid composition of a first lipid solution which constitutes the artificial lipid bilayer membrane.

2. The method as set forth in claim 1 comprising the steps of:

(i) forming a lipid bilayer membrane by using the first lipid solution;

(ii) injecting into the tubule the second lipid solution whose lipid composition is different from the lipid composition of the first lipid solution; and

(iii) bringing the tubule into the bulk phase of the lipid bilayer membrane so as to add the second lipid solution to the bulk phase.

3. The method as set forth in claim 2 further comprising the step (iv) of sucking a surplus first lipid solution by using the tubule after carrying out the step (iii).

4. The method as set forth in claim 2 or 3, wherein

the step (i) is carried out in accordance with a painting method or a folding method.

5. The method as set forth in any one of claims 1 to 4, wherein

the artificial lipid bilayer membrane includes a channel molecule.

6. The method as set forth in claim 5, wherein

the first lipid solution includes no ergosterol, and the second lipid solution includes ergosterol, and the channel molecule is amphotericin B.

7. An artificial lipid bilayer membrane whose lipid composition is changed in accordance with the artificial lipid bilayer membrane lipid substitution method as set forth in any one of claims 1 to 6.

8. An artificial lipid bilayer membrane formation device, comprising: a first solution chamber and a second solution chamber both of which are filled with aqueous solution; and a partition wall disposed between the first solution chamber and the second solution chamber so as to part the first solution chamber and the second solution chamber from each other,

the partition wall having an opening around which a first lipid solution is applied so that a lipid bilayer membrane is formed on the opening,

wherein:

a tubule for lipid substitution is attached to the partition wall so as to be positioned in a vicinity of the opening, and a second lipid solution whose lipid composition is different from a lipid composition of the first lipid solution is injected via the tubule so as to form an artificial lipid bilayer membrane including a lipid of the second lipid solution as a component of the artificial lipid bilayer membrane.

9. The artificial lipid bilayer membrane formation device as set forth in claim 8, wherein the tubule is connected to a micromotion manipulator.

10. An ion permeation measuring device, comprising: a first solution chamber and a second solution chamber both of which are filled with aqueous solution; and an electrode for detecting a current flowing in the aqueous solution,

the ion permeation measuring device measuring ion permeation in an ion channel provided in an artificial lipid bilayer membrane formed in a border between the first solution chamber and the second solution chamber,

wherein:

the artificial lipid bilayer membrane is formed on an opening provided in a partition wall disposed between the first solution chamber and the second solution chamber, and

a tubule for lipid substitution is attached to the partition wall so as to be positioned in a vicinity of the opening.

11. The ion permeation measuring device as set forth in claim 10, wherein formation of the artificial lipid bilayer membrane is carried out in accordance with a painting method or a folding method.

12. The ion permeation measuring device as set forth in claim 10 or 11, wherein the tubule is connected to a micromotion manipulator.